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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,777	02/27/2004	Hung-Chin Guthrie	HIT1P057/HSJ920030250US1	1914

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ZILKA-KOTAB, PC
P.O. BOX 721120
SAN JOSE, CA 95172-1120

EXAMINER	
TUGBANG, ANTHONY D	
ART UNIT	**PAPER NUMBER**
3729	

MAIL DATE	DELIVERY MODE
05/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/789,777	GUTHRIE ET AL.	
	Examiner	Art Unit	
	A. Dexter Tugbang	3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) *1-5,7 and 9-18* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6* is/are rejected.

7)☒ Claim(s) *8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The applicant(s) amendment filed on February 7, 2007 has been fully considered and made of record.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Election/Restriction

3. Claims 1 through 5, 7 and 9 through 18 continue to stand as being withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on November 7, 2006.

Claim Rejections - 35 USC § 103

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the AAPA in view of Mueller et al and Kaufman et al.

The AAPA (specification, pages 1-7, Prior Art Figures 1-7) discloses a method for forming a Cu coil for use in a magnetic head comprising: forming a magnetic pole structure (e.g. 405); depositing a photoresist (e.g. 404 or 410); depositing a hard mask (e.g. 406); patterning the hard mask to define a coil pattern through the use of the photoresist (e.g. 410); performing a material removal process (e.g. deep reactive ion etch) to form at least one trench (e.g. channels 412) according to the coil pattern; depositing Ta (e.g. 502); depositing Cu (e.g. 504); and

performing a chemical mechanical polishing (CMP) process to remove material from the photoresist, the hard mask, Ta, and Cu (see sequence of Prior Art Figures 6 to 7).

The AAPA teaches substantially all of the limitations of the claimed manufacturing process except that the CMP process includes a slurry comprising at least: Ammonium Persulfate, Benzotriazole (BTA), and SiO_2.

Both Kaufman and Mueller disclose that it is known within CMP processes to use a slurry that includes various components to planarize, etch, or remove metal materials and dielectric materials.

Kaufman teaches that a slurry in a CMP process that removes material of copper and other dielectric materials has at least three components: 1) a film forming agent of *benzotriazole* (col. 5, lines 44-65); 2) an abrasive of silica, i.e. SiO_2 (col. 7, lines 1+); and 3) and an oxidizer of *ammonium persulfate* (col. 9, lines 45-60). The purpose of having at least these three components within the slurry provides at least one advantage of providing desirable polishing rates between metal layers and the dielectric insulating layers (col. 8, lines 35-43).

Mueller teaches the very same three components of a slurry within a CMP process as Kaufman. Mueller suggests another advantage of having these three components in the slurry, which is that these components altogether make a slurry composition that provides tailored effective polishing rates of metal layers (e.g. copper) that minimizes surface imperfections, defects, corrosion and erosion, while offering polishing selectivities to other thin-film materials (col. 2, lines 15-27).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of the AAPA by including the specific three components

of a slurry with the CMP process, as taught by Kaufman and Mueller, for the purpose of removing material from the metal layers (e.g. Cu, Ta) and other dielectric layers (e.g. photoresist, hard mask), as Mueller and Kaufman each have their own associated advantages.

Response to Arguments

5. The applicant(s) arguments filed on February 7, 2007 have been fully considered but they are not persuasive.

In response to applicant's argument that the AAPA, Mueller et al and Kaufman et al are nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the references to the AAPA, Mueller et al and Kaufman et al, are reasonably pertinent and analogous to each other because each is solving the very same problems associated with CMP processes involving metals (e.g. at least Cu) and dielectric materials.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the combination of the above references would produce a reasonable

expectation of success to the extent that Mueller and Kaufman offer explicit advantages for their teachings. These advantages, taken altogether along with each solving the very same problems associated with CMP processes, provide the proper motivation for making the above combination.

Finally, with respect to the argument regarding the references to Mueller and Kaufman having materials related to a semiconductor device and the AAPA having materials related to a magnetic device, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Allowable Subject Matter

6. Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form, including all of the limitations of the base claim and any intervening claims.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Dexter Tugbang whose telephone number is 571-272-4570. The examiner can normally be reached on Monday - Friday 7:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A. Dexter Tugbang
Primary Examiner
Art Unit 3729

April 22, 2007